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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/446,008	03/14/2000	GILLIAN F. MARSHALL	124-738	1673

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EXAMINER

TILLERY, RASHAWN N

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/446,008

**Applicant(s)**

MARSHALL ET AL.

**Examiner**

Rashawn N Tillery

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 22-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to claims 22-42 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22, 23, 25, 31-35 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's conceded prior art in view of Dodson, III (US3872329).

Regarding claims 22 and 38, Applicant's prior art discloses, in figure 1, a photodetector circuit, the circuit comprising:

a photodetector (12), and

a current load device (14) connected to the photodetector for providing an output signal having an illumination dependent contribution and a leakage current contribution (see page 1, line 18), the device having a current-voltage characteristic in which voltage is a logarithmic function of current (see page 1, line 13), the photodetector supplying an output current to the current load device (see page 1, line 10).

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Applicant's prior art does not expressly disclose a phototransistor for providing a gain. Dodson teaches that it is well known in the art to utilize phototransistors in photodetector circuits. Dodson teaches that phototransistors are multi-functional and are capable of performing both photo-sensing and amplification. See col. 1, lines 3-14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Applicant's prior art teachings by implementing Dodson's teachings of phototransistors since Dodson is capable of maintaining both current and voltage levels substantially equal to a reference current and reference potential, respectively. This allows the two to be adjusted independently of each other, thus preventing saturation of the voltage. See col. 1, lines 39-55; also see col. 2, line 28 to col. 3, line 35. Consequently, Dodson's teachings implemented in Applicant's prior art device would produce a thermally insensitive photodetector circuit whereby the phototransistor provides a gain sufficiently high that the illumination dependent contribution to the output signal exceeds the leakage current contribution.

Regarding claim 23, the examiner notes that the combination of Applicant's prior art teachings and Dodson discloses a photodetector circuit which is substantially insensitive to temperature over a range of light intensity and temperature normally to be encountered in a daytime natural environment since Dodson is capable of independently adjusting voltage and current levels for saturation prevention.

Regarding claim 25, the combination of Applicant's prior art teachings and Dodson discloses the current load device is a MOSFET having one of a source (16) and a drain connected to the phototransistor and the phototransistor is arranged to produce

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a current low enough to operate the MOSFET in a sub-threshold regime (see page 10, line 18 to page 11, line 10 where figure 1 is discussed).

Regarding claim 31, Applicant's prior art discloses, in figure 1, the photodetector circuit is incorporated in an array of like circuits (10).

Regarding claim 32, Applicant's conceded prior art does not expressly disclose the type of system that incorporates the array of photodetector circuits. However, Official Notice is taken that it is well known in the camera art to utilize an array of photodetector circuits in a digital camera. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the array of photodetector circuits in a digital camera since photodetector circuits are notoriously associated with cameras.

Regarding claim 33, Applicant's conceded prior art does not expressly disclose the type of system that incorporates the array of photodetector circuits. However, Official Notice is taken that it is well known in the camera art to utilize an array of photodetector circuits in digital cameras mounted in automobiles. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the array of photodetector circuits in a digital camera since photodetector circuits are notoriously associated with cameras.

Regarding claim 34, Applicant's conceded prior art does not expressly disclose the type of system that incorporates the array of photodetector circuits. However, Official Notice is taken that it is well known in the camera art to utilize an array of photodetector circuits in a hand-held computer technologies such as PDAs and cellur

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camera phones. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the array of photodetector circuits in a hand-held computer technology since photodetector circuits are notoriously associated with cameras.

Regarding claim 35, Applicant's conceded prior art does not expressly disclose the type of system that incorporates the array of photodetector circuits. However, Official Notice is taken that it is well known in the camera art to utilize an array of photodetector circuits in PDAs. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the array of photodetector circuits in a PDA since photodetector circuits are notoriously associated with cameras.

2. Claims 24, 26, 27 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's conceded prior art in view of Dodson, III in further view of Tanaka (US5965892).

Regarding claim 24, Neither Applicant's prior art nor Dodson expressly disclose the phototransistor and current load device fabricated using BiCMOS technology. Tanaka reveals that it is well known in the art to fabricate a bipolar transistor and MOSFET using a BiCMOS technology (see col. 7, lines 36-46). It would have been obvious to one of ordinary skill in the art to implement Tanaka's teachings in an effort to fabricate the bipolar-MOSFET structure at a sufficiently low cost.

Regarding claim 26, neither Applicant's prior art nor Dodson explicitly disclose a bipolar transistor. Tanaka reveals that it is well known in the art to utilize a bipolar transistor connected to a MOSFET (see col. 7, lines 21-35). It would have been

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obvious to one of ordinary skill in the art to implement Tanaka's teachings since bipolar transistors have a large mutual conductance and a relatively low noise.

Regarding claim 27, the combination of Applicant's prior art- figure 1- and Dodson discloses the load MOSFET and phototransistor are connected at a common connection point (18) to buffering means (22) and the buffering means is connected to a pixel readout circuit.

Regarding claim 39, Neither Applicant's prior art nor Dodson expressly disclose the phototransistor and current load device fabricated using BiCMOS technology. Tanaka reveals that it is well known in the art to fabricate a bipolar transistor and MOSFET using a BiCMOS technology (see col. 7, lines 36-46). It would have been obvious to one of ordinary skill in the art to implement Tanaka's teachings in an effort to fabricate the bipolar-MOSFET structure at a sufficiently low cost.

3. Claims 28, 29, 30 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's conceded prior art in view of Dodson, III in further view of Sowers et al (US6259364).

Regarding claims 28 and 40, neither Applicant's prior art nor Dodson explicitly disclose an attenuator. Sowers teaches a horn switch for activating a vehicle's horn. The horn switch has a light source and a phototransistor for receiving light. The intensity of the light is attenuated by a means for reducing the light signal intensity and sufficient attenuation of the light signal will activate a vehicle's horn. See col. 2, line 36 to col. 3, line 38. The examiner acknowledges that the prior art reference may not be in Applicant's field of endeavor; however, the examiner feels that the prior art teachings

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are "reasonably pertinent to the particular problem with which the inventor was concerned." See MPEP 2141.01(a). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement Sowers' teachings of attenuation of a light signal for altering the output current of a phototransistor in an effort to inexpensively maintain illumination intensities.

Regarding claims 29 and 30, neither Applicant's prior art nor Dodson explicitly disclose operable temperature ranges for the circuit. Sowers teaches a horn switch for activating a vehicle's horn. Sowers constructed a prototype comprised a light emitting diode, resistors and phototransistor. The prototype was used to determine the inventions functionality over the temperature ranges of -40 degrees Celsius to +85 degrees Celsius. See col. 2, line 62 to col. 3, line 12. The examiner acknowledges that the prior art reference may not be in Applicant's field of endeavor; however, the examiner feels that the prior art teachings are "reasonably pertinent to the particular problem with which the inventor was concerned." See MPEP 2141.01(a). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement Sowers' teachings so that the present invention could properly function through a large temperature range.

4. Claims 36, 37, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's conceded prior art in view of Dodson, III, in further view of Tanaka in further view of Sowers et al.

Regarding claims 36, 37, 41 and 42, Applicant's prior art discloses, in figure 1, a photodetector circuit incorporating a photodetector (12) connected to one of a source



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(16) and a drain of a MOSFET (14) having a current-voltage characteristic in which voltage is a logarithmic function of current (see page 1, line 13), wherein the photodetector is arranged to supply an output current to the MOSFET sufficiently low to operate the MOSFET in a sub-threshold regime (see page 10, line 18 to page 11, line 10 where figure 1 is discussed), the photodetector and the MOSFET are arranged to provide an output signal having an illumination dependent contribution and a leakage contribution (see page 1, line 18).

Applicant's prior art does not expressly disclose a phototransistor for providing a gain. Dodson teaches that it is well known in the art to utilize phototransistors in photodetector circuits. Dodson teaches that phototransistors are multi-functional and are capable of performing both photo-sensing and amplification. See col. 1, lines 3-14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Applicant's prior art teachings by implementing Dodson's teachings of phototransistors since Dodson is capable of maintaining both current and voltage levels substantially equal to a reference current and reference potential, respectively. This allows the two to be adjusted independently of each other, thus preventing saturation of the voltage. See col. 1, lines 39-55; also see col. 2, line 28 to col. 3, line 35. Consequently, Dodson's teachings implemented in Applicant's prior art device would produce a thermally insensitive photodetector circuit whereby the phototransistor provides a gain sufficiently high that the illumination dependent contribution to the output signal exceeds the leakage current contribution.

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Neither Applicant's prior art nor Dodson expressly disclose the phototransistor and current load device fabricated using BiCMOS technology. Tanaka reveals that it is well known in the art to fabricate a bipolar transistor and MOSFET using a BiCMOS technology (see col. 7, lines 36-46). It would have been obvious to one of ordinary skill in the art to implement Tanaka's teachings in an effort to fabricate the bipolar-MOSFET structure at a sufficiently low cost.

Neither Applicant's prior art nor Dodson or Tanaka explicitly disclose operable temperature ranges for the circuit. Sowers teaches a horn switch for activating a vehicle's horn. Sowers constructed a prototype comprised a light emitting diode, resistors and phototransistor. The prototype was used to determine the inventions functionality over the temperature ranges of -40 degrees Celsius to +85 degrees Celsius. See col. 2, line 62 to col. 3, line 12. The examiner acknowledges that the prior art reference may not be in Applicant's field of endeavor; however, the examiner feels that the prior art teachings are "reasonably pertinent to the particular problem with which the inventor was concerned." See MPEP 2141.01(a). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement Sowers' teachings so that the present invention could properly function through a large temperature range.

### ***Conclusion***

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. DeMarco teaches a system for transmitting mobile radio signals.

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The system utilizes an attenuator. Engstrom teaches a temperature compensated opto-electronic circuit functional in a large temperature range.

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rashawn N Tillery whose telephone number is 703-305-0627. The examiner can normally be reached on 9AM-6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RNT

  
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